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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,068	06/22/2005	Johannes Van Wingerden	NL02 1489 US	2988
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EXAMINER				
ALAM, RASHID A				
ART UNIT		PAPER NUMBER		
1795				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/540,068

Applicant(s)

VAN WINGERDEN ET AL.

Examiner

RASHID ALAM

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-893)
Paper No(s)/Mail Date 06/22/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Detailed Action

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 6, 7, rejected under 35 U.S.C. 102(b) as being anticipated by Mansfield (US 5,965,306).

Regarding claim 1, 6, and 7, Mansfield teaches a method of determining the best process variables in transferring a mask pattern onto a substrate (see abstract). This method employs determining the appropriate wafer and mask CD tolerances (see column 7, lines 25-30). Mansfield also teaches obtaining a data set to be used (column 8, lines 1-10) and comparing the critical dimensions to the mask critical dimension error (see abstract). A statistical distribution is then defined (see column 7, lines 35-40). Coefficients of an analytical model with best focus and exposure dose are taken (see figure 1D and claim 4) and an average CD variation is calculated (see column 7, lines 25-30).

Regarding claim 2, Mansfield teaches another parameter, CD error, used along with focus and exposure dose in the calculations to determine the best process variables in transferring a mask pattern onto a substrate (see figure 5A).

Regarding claims 3 and 4, Mansfield teaches the standard deviation of a statistical feature size distribution which in which the object of the analysis is to

determine a functional relationship between the metric and the mask CD error (see column 7, lines 40-47 to column 8, lines 1-10). The calculation of the error employs average values of exposure dose and focus values (see figure 1D and claim 4 and column 7, lines 25-30).

Regarding claim 8, Mansfield teaches he image of the photomask that is projected onto the photoresist by the lithography exposure tool (see column 2, lines 12-15).

Regarding claim 9, Mansfield teaches a device being made from the method column 5, lines 1-5).

Regarding claim 10, Mansfield teaches a computer program for use in the method (see claim 40).

Regarding claim 11, Mansfield teaches a lithographic mask with the pattern determined from the method and calculations (see abstract).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5 rejected under 35 U.S.C. 103(a) as being unpatentable over Mansfield (US 5,965,306), as applied to claims 1-3, 6, and 7, and further in view of Liebmann (US 6,553,559).

Regarding claim 5, Mansfield teaches as stated above in paragraph 2. However, Mansfield is silent about a mask bias as variable.

Liebmann teaches finding the mask bias that optimizes the process window (see column 5, lines 24-31). Therefore, it would have been obvious to one skilled in the art at the time of the invention to use a mask bias as a variable in determining the best process variables in transferring a mask pattern onto a substrate, because Liebmann teaches a series of other pitches and mask biases are analyzed by finding the common process window with the reference pitch in order to provide a method of generating OPC and assist feature rules which provide improved wafer performance under typical manufacturing variations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RASHID ALAM whose telephone number is (571)270-3959. The examiner can normally be reached on Mon.-Fri. 7:30 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark F. Huff/
Supervisory Patent Examiner, Art Unit
1795

/RASHID ALAM/
Examiner, Art Unit 1795